

Application No. 09/913,966  
Response dated November 28, 2006  
Reply to Office Action dated September 28, 2006

### **REMARKS**

This is a response to the Office Action mailed September 28, 2006. Claims 1-20 are pending. Claims 1-4, 6-9, 11-13, 15, and 18-20 are rejected. Claims 14 and 16-17 are objected to. Claims 5 and 10 are objected to, but indicated as allowable if rewritten in independent form. New claims 21 and 22 have been added. The Commissioner is authorized to charge Deposit Account 50-0694 for any additional claims fees.

#### **Summary of Office Action and Response**

Claims 1-4, 6, 7, 9, 12, 13, 15, and 19 were rejected under 35 U.S.C. 102(b) as being anticipated by Christensen (WO 96/00189). This rejection is respectfully traversed.

Claim 11 was rejected under 35 U.S.C. 103(a) as being unpatentable over Christensen (WO/96/00189) in view of Urwin (EP 0499362A1). This rejection is respectfully traversed.

Claims 18 and 20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Christensen (WO/96/00189) in view of Jachuck and Ramshaw Process Intensification: Heat Transfer Characteristics of Tailored Rotating Surfaces Heat Recovery System and CHP (Vol. 14 pp. 475-491, 1994). This rejection is respectfully traversed.

Claims 5 and 10 were objected to but indicated as allowable if rewritten in independent form. Applicants have amended claim 5 to be in independent form. Claim 10 depends on claim 5.

The Examiner indicated that it was unclear whether claims 14, and 16-17 remained in the case or were rejected. Applicants have included claims 14 and 16-17 in this case in unamended form. Based on earlier requirements of the Commissioner during the year 2001 (when the preliminary amendment was filed in this case), in the section for Amendments Applicants listed only the claims to be amended. Because claims 14 and 16-17 were not amended in the preliminary amendment they were not listed in this section. However, in the Appendix entitled "Copy of Amendments Showing Changes," Applicants listed all claims including claims 14 and 16-17. In this Response in the Amended Section Applicants have now listed all claims including claims 14 and 16-17.

**Detailed Response**

Claims 1-4, 6, 7, 9, 12, 13, 15, and 19 were rejected under 35 U.S.C. 102(b) as being anticipated by Christensen (WO 96/00189)

The Examiner concluded that “Christensen 189 teaches a process whereby a vibrational energy source is applied to the substrate when on and as being applied to the rotating surface, as well as the rotating surface is mounted off-centre on the axis of rotation.” It is respectfully suggested that Christensen does not teach or disclose the claimed “additional vibrational energy is applied to the substrate.”

Applicants have reviewed Christensen and can find nothing which would teach or disclose the application of additional vibratory energy to the substrate either by passive or active modes. Figure 3 of Christensen specifically discloses a spinning disc 6A which is centrally mounted. Furthermore, Christensen states, in pertinent part that “In use, effluent is pumped upwardly through rotating axle 4A and emerges centrally on the upper most surface of disc 6A. Centrifugal forces assist in the passage of effluent outwardly across the upper surface of disc 6A towards the outer perimeter of the same. This arrangement results in the creation of a relatively turbulent flow of a thin film of effluent over the upper most surface of the disc 6A.” (Christensen: pg. 20, lines 5-10). Such a centrally mounted disc would not have additional vibrations applied to the substrate.

Contrary to the Examiner’s apparent conclusion, Applicants submit that it is the general prejudice in the art to eliminate the vibration of rotational structures. Accordingly, Applicants submit that the art teaches away from the creation of additional vibrations in rotational structures. In contrast to the prior art, the claimed invention seeks to apply additional vibration so as to improve reaction conditions on the substrate, such as be increasing the mixing of the reacting components and/or increasing the available energy for the reacting components.

In pertinent part the specification states that “The apparatus as hereinbefore defined may comprise a means for optimising conversion conditions. For example, means for imparting an additional movement to the rotating surface, and thus to the substrate, may be provided. Such movement could be in any desired plane or plurality of planes and preferably comprises vibration. Any suitable vibration means may be provided, such as flexible mounting of the

surface or off centre mounting, both inducing passive vibration or active vibration means, such as a mechanical element in contact with the rotating element and vibrating in a direction parallel to the rotating element axis. Preferably a passive vibration means is provided in the form of off centre mounting of the rotating element on its axis of rotation. Vibration may alternatively be provided by an ultrasonic emitter in contact with the rotating element for vibration in any desired plane or plurality of planes.” (PCT Application as published: pg. 9, lines 31-45). These are examples of additional vibration being added to improve reaction conditions.

Based on the above it is respectfully suggested that the rejection of claim 1 should be withdrawn. Additionally, because dependent claims 2-4, 6, 7, 9, 12, 13, 15, and 19 depend directly or indirectly on claim 1, it is respectfully suggested that the rejection of these dependent claims should also be withdrawn.

Additionally, Christensen does not teach or disclose claim 2's “wherein the additional vibrational energy is applied to the substrate when on the rotating surface”; claim 3's “wherein the additional vibrational energy is applied to the substrate as it is being supplied to the rotating surface”; claim 4's “wherein the additional vibrational energy is applied to the substrate after it has flowed across the rotating surface; claim 6's “wherein the rotating surface is mechanically vibrated”” claim 7's “wherein the rotating surface is mounted off-centre on the axis of rotation”; claim 9's “wherein a mechanical vibrator is attached to the surface or the support element”; claim 12's “wherein the solid phase agent comprises a nucleation or growth agent adapted for fluid phase substrate conversion by phase change to form crystals or grow seed crystals”; claim 13's “wherein the solid phase agent comprises a reagent, catalyst or initiator adapted for fluid phase substrate conversion by reaction to form products; claim 15's “wherein the solid phase agent is a refractory oxide”; and/or claim 19's “wherein additional thermal or radiation energy, including UV, IR, microwave, RF, X-ray, electric fields and magnetic fields, is applied to the substrate.”

For the specified reasons, it is respectfully suggested that each of these dependent claims are separably allowable over independent claim 1.

Rejection of Claim 11 under 35 U.S.C. 103(a) as being unpatentable over Christensen (WO/96/00189) in view of Urwin (EP 0499362A1).

Applicants adopt in total the arguments regarding independent claim 1. Because claim

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11 depends on claim 1, it is respectfully suggested that the rejection of claim 11 should be withdrawn.

Rejection of Claims 18 and 20 under 35 U.S.C. 103(a) as being unpatentable over Christensen (WO/96/00189) in view of Jachuck and Ramshaw Process Intensification: Heat Transfer Characteristics of Tailored Rotating Surfaces Heat Recovery System and CHP

Applicants adopt in total the arguments regarding independent claim 1. Because claims 18 and 20 depend on claim 1, it is respectfully suggested that the rejection of claims 18 and 20 should be withdrawn.

Applicant respectfully submits that the application is in condition for allowance. A Notice of Allowance is hereby respectfully requested.

Should the Examiner feel that a telephone conference would advance the prosecution of this application, he is encouraged to contact the undersigned at the telephone number listed below.

Applicant respectfully petitions the Commissioner for any extension of time necessary to render this paper timely. Please charge any fees due or credit any overpayment to Deposit Account No. 50-0694.

Respectfully submitted,

/BAN/

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